Leak Visualization of Hydrogen and Helium

I. Objectives To develop leak detection, identification, and quantification techniques which will reduce costs by at least an order of magnitude.

II. Center Point of Contact

Chris Davis, YA-E2, KSC, FL 32899, christopher.davis-1@ksc.nasa.gov
Phone: 321-867-8804 (fax 7-1603), Pager: 321-232-5440

III Technical Methodology/Approach:

1. Research to identify techniques and TRL for gasses.
    - 1.1. Emphasize helium and hydrogen for ground systems.
        - 1.1.1. Draft report shows eleven candidate methods, nine for ground systems = "toolbox"
        - 1.1.2. Complete report including diffusion model. Present findings to KSC researchers and operations personnel
    - 1.2. Raise TRL levels to at least 4
        - 1.2.1. Raise Rayleigh Scattering to level 3 during FY 01/02
        - 1.2.2. Partner, collaborate, confer with other researches to raise all to TRL 4. KSC will manage researchers
        - 1.2.3. Develop "toolbox" for other environments, including in-space
        - 1.2.4. Develop "toolbox" for other gasses.
        - 1.2.5. Present to Programs for appropriate funding and development
    - 1.3. Raise TRL levels to at least 5
        - 1.3.1. Follow same method as above 1.2

IV Customers

Space Shuttle and other launch vehicles, Space Station, extraterrestrial spacecraft, and GSE systems.

V Metrics

1. Increase in the TRL levels of methods by accomplishing goals as required.

VI Products

Methods at TRL 4 then 5 for methods and systems providing it.

VII. Schedule/Milestones

FY01:

- Raise TRL level of Rayleigh Scattering from 1 to 2
- Plan for development of each method from 3 to 4

FY 02

- Raise TRL level of Rayleigh Scattering from 2 to 3
- Raise TRL level in prioritized manner
- Plan for development of each method from 4 to 5